Prehistoric molluscan remains from Tell Aqab, northeast Syria

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Abstract

A small but archaeologically important molluscan assemblage was recovered from Halaf and Ubaid contexts (c. 6th to early 5th millenium BC) at Tell Aqab in Syria. Five distinct taxa were identified; the majority of the molluscs comprise freshwater mussels (unionids) and large terrestrial snails (*Helix* spp.), both of which were likely collected as foods. By contrast, the remains of two species of marine shells, nassa snail (*Nassarius* [*Plicarcularia*] *circumcinctus*) and painted topshell (*Calliostoma zizyphinum*) from Middle and Late Halaf period contexts attest to the use of shell as personal adornment or ornament, and moreover point to the existence of long-distance exchange networks.

Introduction

This paper presents an analysis of a hitherto unexamined assemblage of molluscs (NISP = 185, total weight = 434.7 g) recovered from Tell Aqab, N.E. Syria. Despite the relatively modest size of the assemblage and the limited range of taxa represented, the shells are significant, attesting to long distance exchange networks.

Archaeological background:

The Late Neolithic and Early Chalcolithic periods in northern Syria are characterised by the Halaf and Ubaid cultures. Tell Aqab is situated on the northern edge of the Khabur Plain near the headwaters of the Khabur River, 6 Km north of Amuda in Jezirah Province, Syria (see Fig. 1). Occupation at the site began in the Early Halaf period and continued through into the Ubaid period to c. 3800 BC (Davidson 1981); the site was abandoned before the end of the Ubaid period in this region. This well-stratified mound site, with approximately 12 m of occupation deposits, was excavated over two field seasons from 1975 to 1976 (Davidson and Watkins 1981). Three trenches (1-3) were excavated on the north side of the site from the mound base to the point of highest elevation (i.e. a stepped section) to determine the site stratigraphy. A further trench (4) was placed on the south face of the mound, an area with the greatest surface evidence for Ubaid occupation, to examine stratigraphy and the Halaf-Ubaid transition in this zone of the site (Davidson and Watkins 1981; see Fig. 2). Radiocarbon dates obtained from cereal grains from two contexts at Tell Aqab place the Late Halaf context, Aqab 212, to 5579-5350 cal BC (AA-30498, 6575±55 BP) and the earliest Ubaid context, Aqab 4.19, to 5266-4995 cal BC (AA-30506, 6215±55 BP).

The principal finds at Tell Aqab mirror those of other 'western' Halaf sites as well as those of 'eastern' Halaf sites in northern Iraq. Mud-brick and pisé circular buildings with an open courtyard characterised the Halaf period occupation, while mud-brick rectangular structures were typical of Ubaid period settlement (Davidson and Watkins 1981). Lithic tools, predominantly of obsidian, are represented by retouched and unretouched blades as well as burins and end-scrapers (Davidson and Watkins 1981). Personal adornments and other non-utilitarian artefacts were most abundant in later Halaf and Halaf-Ubaid transition period contexts and include polished stone and obsidian beads, polished stone miniature vessels and seal pendants, several baked-clay female figurines some of which are painted, as well as a painted clay model of a bull's head (Davidson and Watkins 1981).

A large assemblage of pottery sherds was recovered. In the earliest occupation levels deep straight-sided vessels painted with simple geometric designs, round-based 'cream bowl' forms, squat jars with flaring necks, and unpainted straw-tempered burnished wares are abundant. These forms are largely, or in the case of the cream bowl form completely, replaced in the middle Halaf by more complex forms and decoration such as 'Trichterrandbecher' vessels and polychrome wares. In the later Halaf phase new forms including shallow flat-based bowls with out-curved rims and disc-based bowls appear for the first time, while polychrome vessels become more common. Similar Halaf pottery vessels are known from Chagar Bazar and Tell Arpachiyah, both in Iraq. Simple hemispherical bowls

and those with in-curving rims typical of Northern Ubaid painted wares dominate the Ubaid period pottery assemblage at Tell Aqab (Davidson 1981; Davidson and Watkins 1981).

Mollusc Identification and Quantification

All excavated deposits from Tell Aqab were sieved through a 10 mm mesh and retents were sorted to recover faunal remains [see Bartosiewicz, this volume], including molluscs (Davidson and Watkins 1981). Remains of terrestrial and aquatic molluscan species were recovered from each of the four trenches excavated in the 1975 and 1976 field seasons. The molluscan remains were identified by comparison to those held in the reference collections of Archaeology at the University of Edinburgh and the National Museums of Scotland, and also with the use of appropriate identification keys.

Relative species abundance was determined from Minimum Number of Individuals (MNI), Number of Identifiable Specimens (NISP) and shell weight. MNI was calculated for gastropods from the total number of apices of each species, and for bivalves from the larger count of the total left and total right valve umbo for the entire assemblage (see Claassen [1998] and Marshall and Pilgram [1993] for discussion of the analytical worth of the various quantification methods used in archaeomalacology).

Aquatic Taxa

Three aquatic taxa have been identified among the Tell Aqab molluscan remains: swollen nassa snail (*Nassarius* [Plicarcularia] *circumcinctus* [Adams 1852]), painted topshell (*Calliostoma zizyphinum* [Linnaeus 1758]) and freshwater mussel (Unionoida).

Freshwater taxa:

Freshwater mussels (Unionoida) dominate the shell assemblage recovered at Tell Aqab comprising 98.4% of the assemblage by NISP (n=182), 90% by MNI (n=27), and 98.6% by weight (see Table 1).

Table 1. Aquatic mollusc species from Tell Aqab. Cultural affiliation/chronology of the shell samples was determined from the description of the excavated trenches and levels provided in Davidson and Watkins (1981). As the find contexts of some of the shell remains were recorded by trench number only, and given the small size of the assemblage, no attempt was made to compare species representation by cultural period.

Cultural Affiliation	Taxon (NISP)			Taxon (MNI)		
	Unionoida	*N. circumcinctus*	*C. zizyphinum*	Unionoida	*N. circumcinctus*	*C. zizyphinum*
Early Halaf	14			3		
Middle Halaf	60	1		9	1	
Late Halaf	4	1	1	-	1	1
Halaf/Ubaid transition	1	-				
Ubaid	4					
Unspecified	99			15		
Total	**182**	**2**	**1**	**27**	**2**	**1**

The preservation condition of the Unionoida (*i.e.* Unionidae/Magaritiferidae) shells is moderate to poor: the periostracum is largely lost and the shells have a chalky consistency. Furthermore, the remains are highly fragmented. Attribution to species is further complicated by the taxonomic diversity debate between 'lumpers' who argue that Palearctic unionids are represented by 45 species, and 'splitters' who identify 156 species (see Graf and Cummings [2007] for discussion). Only three almost complete valves of unionids were recovered – see Fig. 3; these can be attributed to the *Unio* genus. Graf and Cummings (2007) recognize four species of *Unio* in the Middle East; *Unio crassus*, *Unio mancus*, *Unio terminalis* and *Unio tigridis*. The near complete valves from Tell Aqab have an elongated oval form, pronounced umbone positioned close to the anterior edge, rounded anterior and sub-triangular posterior with a slight 'rostrum', and strong cardinal tooth. Their form and dimensions (see Table 2) are consistent with *U. tigridis/terminalis* (Bourguignat 1853; Şereflişan and Yilmaz 2011). The height of the *U. crassus* shell is generally less than half of its length and the shell radius is usually thick. *U. tigridis* is endemic to the Tigris (Bourguignat 1853; Haas 1969), whereas, the closely related species *U. terminalis*, which is distinguished from *U. tigridis* by slight differences in bivalve thickness, hinge structure, rostrum prominence and umbone position (Bourguignat 1853), likely inhabits different river systems (Mienis 2013). While this supports attribution to *U. tigridis*, species level identification of the Tell Aqab specimens is non-trivial as (i) the condition of the valves is relatively poor, and (ii) wide intra-species variation in *Unio* shell form and size have been observed (Hochwald 2001; and see plate 2: 1-5, Plaziat and Younis [2005]). Given the fragmentary nature of most of the Unionoida shells recovered at Tell Aqab more than one and possibly several species may be represented.

Table 2. Dimensions of intact valves at Tell Aqab.

Context	Taxon	R/L valve	Length (mm)	Height (mm)
2.1 (Halaf)	*Unio*	R	67.6	35.0
T4.8 (Halaf or Ubaid)	*Unio*	L	70.9	39.9
Middle Halaf	*Unio*	L	64.6	32.4

Marine species:

Two specimens of *N. circumcinctus* and one of *C. zizyphinum* were recovered from Middle and Late Halaf contexts at Tell Aqab (see Figs 4 and 5). Both are obligate marine species.

Nassarius spp. and *C. zizyphinum* are relatively commonplace on the shores of the Mediterranean. Carnivorous *Nassarius* spp. generally lie buried in soft substrates except when feeding (Crisp 1978). Although carnivorous species are generally less abundant than herbivorous species the shells of nassa snails can be readily collected empty along the shoreline. *Nassarius* spp. are generally a small shelled species (adults reaching a length of 15-20 mm) with relatively little meat/flesh and not considered an important food species.

By contrast *C. zizyphinum* generally lives on seaweed on rocky shores from the sub-littoral region to depths of 300 m in the UK (Hayward and Ryland 1990), although its ecological preferences in the Mediterranean have not been recorded. It is a relatively small species attaining maximum height of 34 mm (Crothers 2001).

Discussion of the aquatic species:

Freshwater mussels are commercially important food species (*e.g.* Anthony and Downing 2001) and are also widely exploited for their nacreous, mother of pearl, inner surface (*e.g.* Şereflişan and Yilmaz 2011). Shell was also used as temper in pottery production in the Ubaid period at Tell al-'Abr, northeastern Syria (Weiss 1991). Exploitation of shellfish, likely for food and possibly as raw material, is evident at a number of pre- and proto-historic sites situated near the Tigris and its tributaries and elsewhere in the Middle East. At the Samarran period (6^{th} millennium BC) site of Tell es-Sawwan, Iraq, the freshwater mussel species *U. tigridis* and *Pseudodontopsis euphraticus* were heavily exploited (Flannery and Wheeler 1967). Freshwater molluscs are reported in small quantities at Halafian several sites including Sabi Abyad and Umm Qseir in northern Syria (Akkermans 1987; Zeder 1994). *U. crassus* and *U. tigrids* were identified both at Girikihaciyan and at Çavi Tarlası in southeastern Anatolia (Schäfer and Boessneck 1988; McCardle 1990). The remains of freshwater molluscs are also reported from Ubaid contexts at Kenan Tepe, S. E. Turkey (Parker et al. 2008). Shell was also widely used in ancient Mesopotamia as a decorative inlay material (Moorey 1999). Although it is likely that the freshwater shellfish were collected for food and/or as a source of raw material at Tell Aqab, Courty (1994) indicates that settlement sites in the Jezirah region during the Halaf-Ubaid-early Uruk period

from 7000-5000 BP were subject to inundation. It is possible, therefore, that Unionoida shells were deposited at certain sites during episodic/occasional flood events.

The ceramic remains from Tell Aqab hint at regional trading links. Neutron activation analysis and characterisation of the Tell Aqab pottery was interpreted by indicated that a large proportion of the pottery was non-local and that there was a high level of trading activity with the nearby production centre of Chagar Bazar, located some 15 km to the south of Tell Aqab (Davidson 1981; although see Galbraith and Roaf [2001] for a re-evaluation of this evidence). The presence of marine shells at Tell Aqab attests to links further afield, between northeastern Syria and coastal regions. Tell Aqab is situated *c*. 550 km from the Mediterranean Sea and *c*. 750 km from the Black Sea. In a recent survey of the distribution of shellfish in the 'Seas of Turkey' neither *C. zizyphinum* nor *N. circumcinctus* were found to be present in the Sea of Marmara or the Black Sea but both species were present on the shores of the Mediterranean/Aegean Seas (Demir 2003).

Although neither *C. zizyphinum* nor small *Nassarius* species are widely consumed as food, both have long been used as raw material for adornments and appear to have held symbolic significance. *Nassarius* species shells (such as the closely related species *N. circumcinctus, N. gibbosulus* and *N. kraussianus*) and other small 'basket-shaped' species have been prized as adornments or ornaments in Africa and the Levant from the Middle Palaeolithic (i.e. the Middle Stone Age of Africa) onwards (Vanhaeren *et al*. 2006; Bouzouggar *et al.* 2007; Bar Yosef Mayer *et al.* 2009; d'Errico *et al*. 2009; Kuhn *et al*. 2009; Stiner 2003). Many specimens recovered from archaeological contexts have perforations ground into the shell likely to facilitate suspension and van Regteren Altena (1962) suggested that such shells may have been attached to clothing. Both of the *N. circumcinctus* specimens recovered at Tell Aqab are perforated and these shells may have been intentionally ground for suspension/adornment.

The *C. zizyphinum* specimen from Tell Aqab was intact and well preserved with some colouration of the periostracum still visible. Although less commonly recovered from early prehistoric archaeological contexts than basket-shaped shells, highly decorative topshells (Trochidae) have also been collected for use as ornaments since the Palaeolithic (*e.g.* Stiner *et al*. 2013).

Numerous annular shell beads, shell plaques and 'buttons' and a single perforated pearl have been recovered at the Ubaid-related site H3, As-Sabiyah, which is located on the coast of northern Kuwait; however relatively few finds of shell artefacts have been documented at Mesopotamian sites (Carter and Crawford 2002). Shells artefacts have been reported in small quantities from Late Neolithic and Early Chalcolithic sites in northern Syria (Akkermans and Schwartz 2003). For example, cowrie shell beads were recovered at Tell Arpachiyah (Campbell 2000). Shell beads were also documented at Halafian Yarim Tepe II (Merpert and Munchaev 1987). Further Halaf/Ubaid period finds of shell artefacts include a shell ring from Tell Oueilli (Huot 1992) and a shell seal stamp from Domuztepe (Campbell 2009).

A minimum of two terrestrial taxa were identified (see Table 3). The terrestrial assemblage is dominated by *Helix* spp. (98.1% by MNI, n=52) – see Fig. 6. One specimen of a near complete and several fragmentary *Xeropicta derbentina* shells were also recovered.

Table 3. Terrestrial molluscan species from Tell Aqab.

Cultural Affiliation	Taxon (NISP)			Taxon (MNI)		
	H. asemnis/dickhauti	Helicidae indet.	*X. derbentina*	*H. asemnis/dickhauti*	Helicidae indet.	*X. derbentina*
Middle Halaf	4			3		
Halaf/Ubaid transition	1			-		
Unspecified	48	3	10	43	-	7
Total	**53**	**3**	**10**	**46**	**0**	**7**

Xeropicta derbentina, Krynicki 1836, is one of the most common terrestrial mollusc species in the Near East (Schütt 2001; Şeşen and Schütt 2000). A small, relatively thin-shelled species, with adults ranging from 12-20 mm in diameter, it is unlikely to be directly related to past human activity at Tell Aqab and was likely naturally-deposited.

The *Helix* sp. specimens range from 22-28 mm in maximum diameter with an average diameter of 25.2±1.6 mm (see Table 4 and Fig. 7 for the shell dimensions and the distribution of the *Helix* sp. shell diameter) with four or four and a half convex whorls and a completely sealed umbilicus. The shells are creamy-white in colour with faint brown spiral bands, coarse growth ridges, regular last turn and high peristome, *i.e.* consistent in form and colour with one of the smaller edible *Helix* species, such as *Helix asemnis*, Bourguignat 1860 or *Helix dickhauti*, Kobelt 1903 (Kebapçi et al. 2012; and see identification key in Yildirim *et al.* [2004]). *H. dickhauti* may be distinguished from *H. asemnis* in modern specimens through differences in colour and band pattern, and potentially by general aperture shape, but have similar shells when weathered (Kebapçi *et al.* 2012). *H. asemnis* is documented to grow up to 40±5 mm in diameter. The maximum diameters of *H. dickhauti* shells are documented as smaller than those of *H. asemnis* (Schütt 2001). The *Helix* specimens from Tell Aqab have relatively small diameters consistent with *H. dickhauti* attribution. However, ecotypical variation is observed in *H. asemnis* populations (Kebapçi *et al.* 2012). The presence of a number of heavily ribbed shells as well as specimens with 'smoother' shells suggests that both species are represented (*cf.* Kebapçi *et al.* 2012). Both species are generalists, can be found in a wide range of open habitats, and are distributed throughout South Turkey and North Syria (*e.g.* Ceylan *et al.* 2008; Yildirim *et al.* 2004).

Table 4. Dimensions of *Helix* sp. at Tell Aqab.

Context	Height (mm)	Width (mm)		Context	Height (mm)	Width (mm)		Context	Height (mm)	Width (mm)
1.1	31.1	n/a		1.1	26.2	24.0		1.14	30.3	26.1
1.1	29.0	27.5		1.1	30.7	26.1		1.15	30.6	26.1
1.1	27.5	25.8		1.1	28.4	25.6		1.15	31.7	26.7
1.1	26.8	27.5		1.1	25.1	22.2		1.15	28.0	23.7
1.1	26.3	26.3		1.1	30.4	24.3		1.15	30.2	26.6
1.1	30.0	24.9		1.1	27.4	24.7		1.15	28.0	24.3
1.1	28.4	25.7		1.1	24.4	20.9		2.1	27.6	23.7
1.1	25.4	23.4		1.6	27.2	25.6		2.10	29.6	26.5
1.1	29.5	25.7		1.14	29.4	25.3		2.10	28.7	25.0

Larger species of terrestrial snails including *H. asemnis*, and in particular *Helix aspersa* and *Helix pomatia*, are commercially farmed today and have been exploited as a food resource since prehistoric times (*e.g.* Lubell 2004; Yildirim *et al.* 2004). One fragment of *Helix* sp. shell recovered at Tell Aqab was discoloured in a manner consistent with heating. This may represent intentional heating or cooking of *Helix* snails or reflect pre- or post-depositional incidental heating. It is therefore possible that the *Helix* snails were collected as food at Tell Aqab. However, there are no definitive indicators for the human use of this species. As there are a number of indigenous synanthropic *Helix* sp. in the Jezireh region the presence of these specimens at Tell Aqab may be incidental to, or may even post-date, Halaf–Ubaid period activity at the site.

Conclusion

Five taxa of terrestrial and aquatic molluscs were recovered from Early Halaf to Ubaid period contexts at Tell Aqab. Harvesting of freshwater mussels as food or raw material is likely, and consumption of edible land snails is possible. However of the taxa identified only two, nassa snail and painted topshell, can be definitively attributed to anthropogenic activity at the site. These marine specimens, which originated at least 550 km distant from Tell Aqab, testify to the existence of long distance exchange networks during the Halaf–Ubaid period.

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Figure Captions

Figure 1. Tell Aqab location map.

Figure 2. Contour plan and section of Tell Aqab mound with location of excavated trenches (T1–T4) indicated.

Figure 3. Examples of near complete Unionoida valves recovered from Tell Aqab.

Figure 4. *Nassarius circumcinctus* specimens recovered from Tell Aqab.

Figure 5. *Calliostoma zizyphinum* specimen recovered from Tell Aqab.

Figure 6. Example of *Helix* sp. shell recovered from Tell Aqab.

Figure 7. Size distribution of maximum diameter of *Helix* spp. shells.

Figure 1.


TURKEY
Tell Aqab
Mediterranean Sea
SYRIA
LEBANON
ISRAEL
WEST BANK
JORDAN
IRAQ
SAUDI ARABIA

Figure 2.

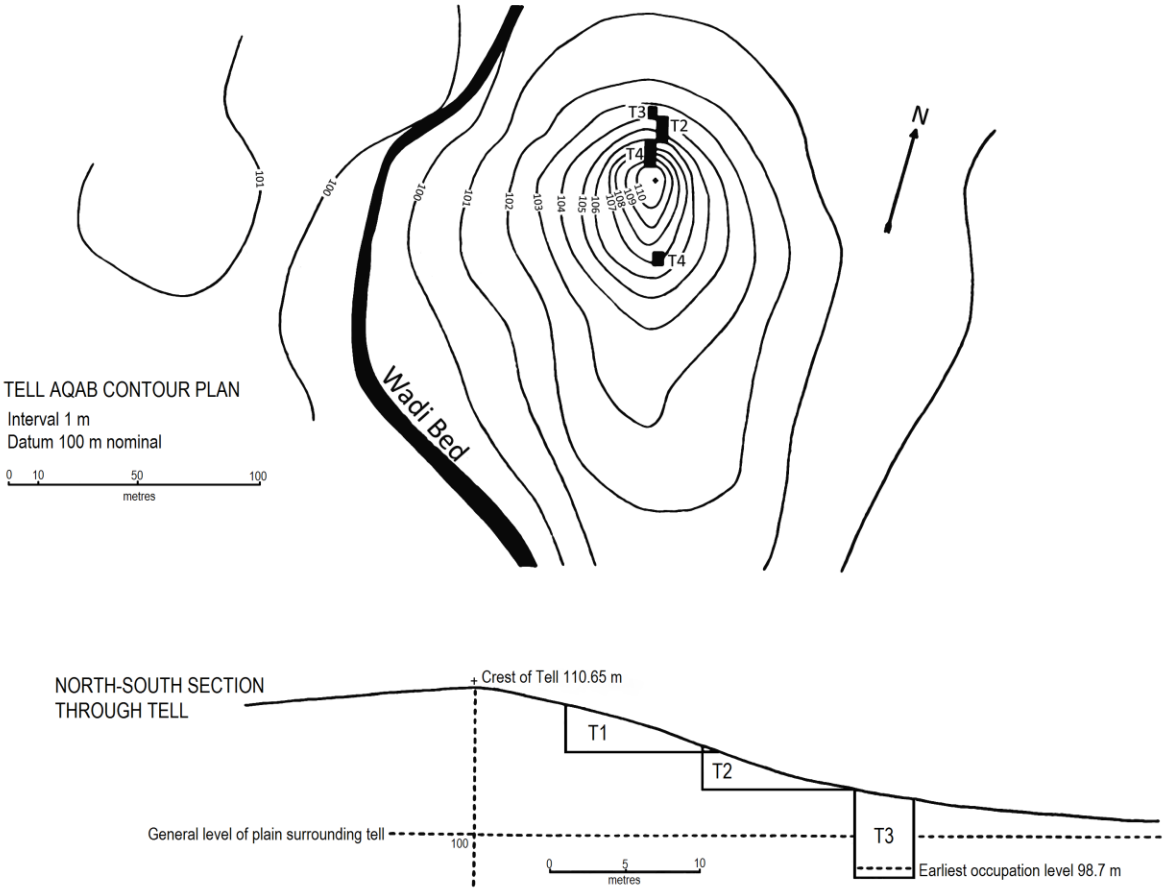

TELL AQAB CONTOUR PLAN
Interval 1 m
Datum 100 m nominal
0 10 50 100
metres
Wadi Bed
T1
T2
T3
T4
N
NORTH-SOUTH SECTION
THROUGH TELL
Crest of Tell 110.65 m
General level of plain surrounding tell
100
0 5 10
metres
Earliest occupation level 98.7 m

Figure 3.

Figure 4.

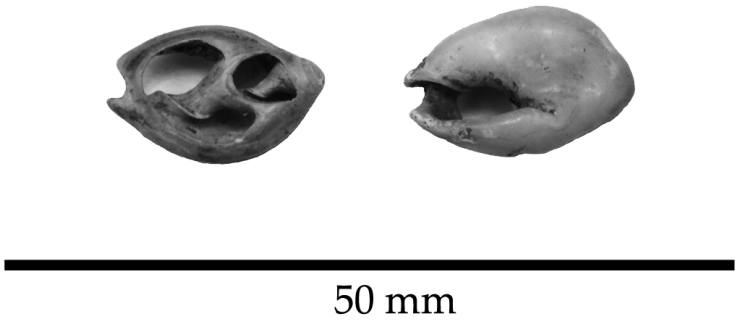


Figure 5.

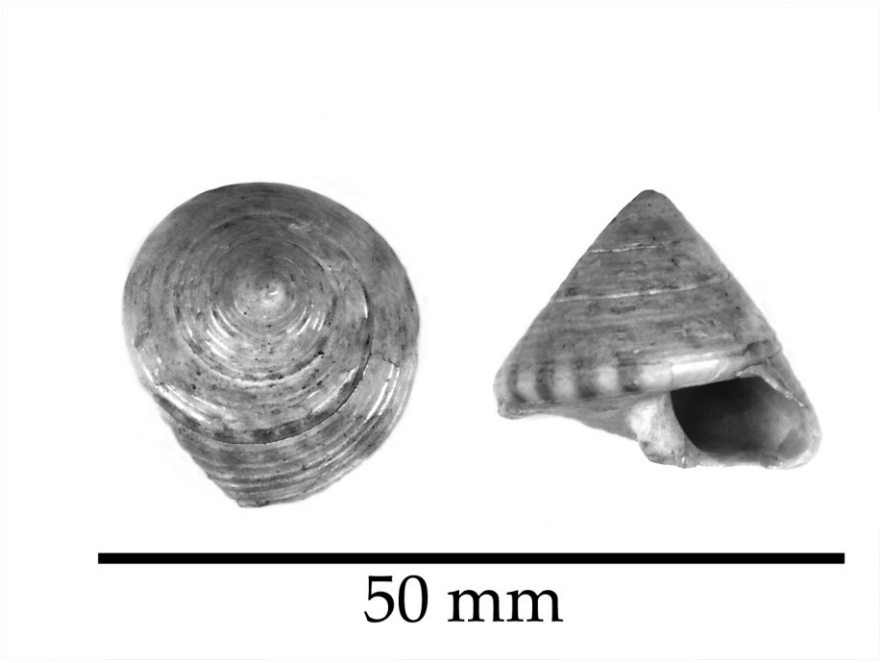


Figure 6.

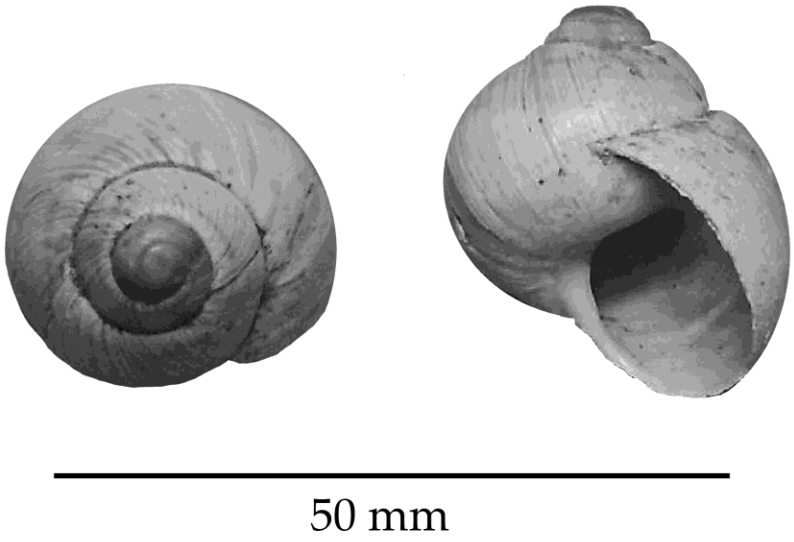
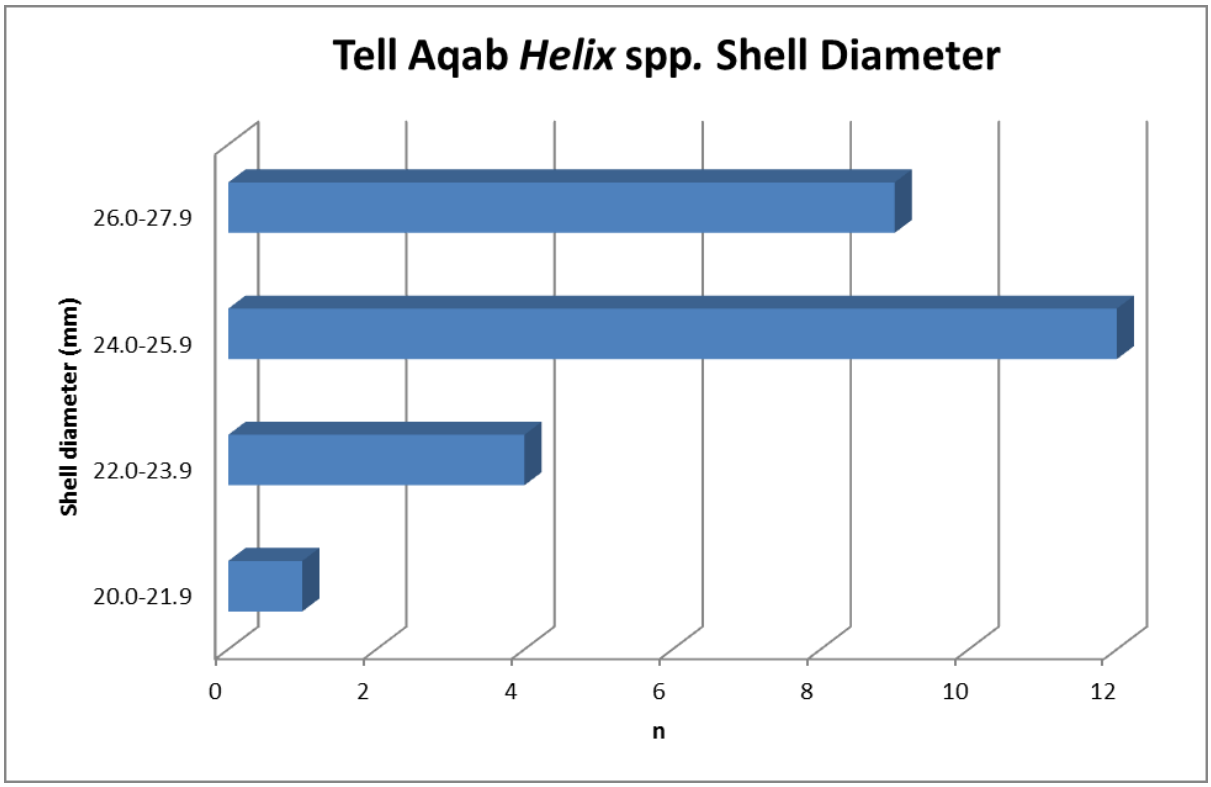


Figure 7.


Tell Aqab *Helix* spp. Shell Diameter
Shell diameter (mm)
26.0-27.9
24.0-25.9
22.0-23.9
20.0-21.9
0
2
4
6
8
10
12
n